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ABSTRACT

The study involving two visually impaired developmentally delayed infants, investigated the role of child/adult interaction in eliciting intentional (goal-directed) communicative behavior. It was hypothesized that child/adult interaction would increase the child's awareness of how his or her actions influence adult behavior and would lead the child to discover strategies of encoding objects and actions in gestures and vocalizations. Three aspects of child/adult interactions were examined over a 2 1/2 to 3 year period: (1) frequency of reciprocal interaction during play, (2) child responses to adult requests, and (3) spontaneous verbalization. The data were consistent with the hypothesis. Reciprocal interaction seems to increase the child's awareness of himself or herself as an active participant in social interaction, capable of influencing and directing adult behavior. (SW)

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INTENTION, INTERACTION AND LANGUAGE DEVELOPMENT IN BLIND AND VISUALLY IMPAIRED DEVELOPMENTALLY DELAYED YOUNG CHILDREN

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INTENTION, INTERACTION AND LANGUAGE DEVELOPMENT IN BLIND AND VISUALLY IMPAIRED DEVELOPMENTALLY DELAYED YOUNG CHILDREN

by Sally Rogow

Recognition of the importance of learning in the early months and years of life has given impetus to the development of intervention programs for handicapped children. The goals of these programs have generally been to stimulate and enhance the ability of handicapped children to interact with and act upon their world. The goals of these programs are deeply influenced by the kinds of theoretical frameworks within which they are conceived. But theories of development are conflicting and the literature is filled with differing and controversial points of view. Questions remain about the type of sensory stimulation to be offered and how it is to be presented. The relative importance of different kinds of sensory experience needs to be clarified. In addition, the impact of sensory impairment is not well understood, nor the various effects of brain damage upon the processing of sensory information. There is a great need for research to clarify these issues. Longitudinal studies of handicapped children in intervention programs can help to clarify the relative importance of certain types of social interactions and sensory experiences and provide a

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deeper understanding of the processes of mental and social development. Longitudinal studies of handicapped children will offer more profound and meaningful bases for educational interventions than studies which compare handicapped with normally developing children. This is especially true of blind children who do not have the visual input available to them and must develop alternate means of understanding their world. This paper will present the findings of such a study.

RELATED RESEARCH

Communication is purposive goal-directed behavior. Intentionality is considered to be the basis of both language and cognition in the infant years (Trevarthen, 1975; Bruner, 1975; Coggins and Sandall, 1983; Bates et al., 1977; Piaget, 1962; Shapiro, 1981).

Intentionality is an expression of the child's understanding that he can act upon the world and affect the events of his life. The relationship between knowing that one is capable of directed action and that actions bring results is considered by Piaget (1962) to be the hallmark of sensory/motor learning. Instrumental actions are expressions of mental development and lead to an understanding of means-ends relationships. Intentional action implies recognition of

persons and events and the relationships between them. It is the recognition of these relationships which kindles interest in making particular events recur. "For only such recognition can kindle an interest not previously there (present) and thus create the beginnings of self-directedness" (Shapiro, 1981, p.42). The capacity to use action as a means to something else depends upon means and goal becoming distinct from one another so that the goal can be anticipated. (Shapiro, 1981).

Much of the research in early language development is based upon the assumption that both language and non-language aspects of cognition emerge at the same point in development. For example, Bates (1977) predicted that both gestural and verbal communication is employed as a tool by infants at the same time as they exhibit tool use with physical objects. Moore and Meltzoff (1969) noted that infants treat language as an object of thought before it becomes an instrument of thought. Piaget (1962) considered the precursors of language development to be imitation, object permanence and internal representation. Bates (1977) argues that the use of objects as tools and an understanding of means-ends relations are pre-requisites to developing a linguistic means for expressing functional intentions.

The importance of intentionality in shaping the infant's communicative and language behavior has been well established (Bruner, 1975; Trevarthen, 1975; Bates, 1977; Moore and Meltzoff, 1969). Intentionality implies a consciousness, a recognition that action is related to events. Communicative intent implies a relation between what the child does and the event that precedes or follows it. Trevarthen (1975) regards the interpersonal transactions of parent and child as the essential ingredient of the process by which awareness is evoked. Through the interpersonal process, the child learns to act with voluntary control. Communication according to Trevarthen (1980) is the first mode of intelligent behavior. The volution of thought processes in the mind of a child and the object perceptions that are associated with them evolve from experience in interpersonal interactions (Trevarthen, 1975). The earliest intentional behaviors exhibited by infants are those which engage adult attention and reciprocal play.

Studies of high-risk infants suggest that early interaction is somewhat disturbed by lack of eye contact and other signal-type behaviors which guide mothers in "play" with their infants. In comparison with normal infants, blind, Downs-syndrome and other failure-to-thrive babies display more fussiness, engage

in less eye contact, initiate fewer interaction sequences and vocalize for more prolonged periods (Field, 1983, p.78). These disturbed interactions have been correlated with later behavioral and other developmental anomalies (Field, 1983).

Those blind children who do not actively explore their environments, who do not seem to attend or interact easily with adults seem especially "at risk" for developing intentional communication. Indeed, one may hypothesize that it is more difficult for blind children to develop models of the environment and so become more dependent on interaction with adults to establish efficient strategies for coping with the environment.

THE PRESENT STUDY

The purpose of the present study was to investigate the role of adult/child interaction in eliciting intentional (goal-directed) and instrumental uses of communicative signals in visually impaired young children. The two children who were the subjects of this study were 1[illegible] months and 7 months of age at the inception of the study.

It was hypothesized that child/adult interaction would increase the child's awareness of how his or her actions influence adult behavior, leading the child to discover strategies of encoding actions and objects in gestures and vocalizations, and to the discovery of language itself as a means of interacting with the world.

METHOD

Measures

Increases in awareness were measured by three aspects of adult/child interaction during the sessions:

1. Frequency of reciprocal interaction with the adult.
2. Child responses to adult requests.
3. Spontaneous verbalization.

Frequency of reciprocal interaction reflects the child's increasing awareness of his or her ability to encode intention and influence the actions of another person. This category reflects the child's recognition of the mutuality and reciprocity involved in social interaction. An interaction was scored only if it initiated an adult response, e.g. engaged the adult in an activity or was an immediate positive response to the adult's action.

Child responses to adult verbal requests indicates the child's comprehension of verbal language. A response was scored only if the child was able to fulfill the request in its entirety in the absence of direct cues, e.g. "Put the blocks back in the box".

Spontaneous verbalization was further divided into four categories:

a. Co-occurence with action - True words or phrases that were uttered while engaged in action, e.g. "up" while

being picked "up" or "water" while splashing in water.

b. Comments - Comments were scored when the child named or described an object or action while not engaged in play with the object or performing the action.

c. Requests - Requests were scored when the child used the name of an object, person or action in order to request something.

d. Performative Vocalizations - Performative vocalizations are sounds that indicate actions and objects, but are not true words Included in this category are onomatopoeic words or protowords such as "wa-wa" uttered when playing with water.

Subjects

Amanda*:

Amanda was 15 months of age at the inception of the study. She is now 4 years and 1 month of age. Amanda was born blind due to bilateral anophthalmia, a condition in which both eyes are absent. A bran scan and an EEG taken after birth were normal. Amanda had a number of febrile seizures in her first year and experienced problems in swallowing and ingesting food. She walked at 1½ years and walked independently at 22 months.

*Names of the subjects have been changed.

Amanda lives with a family comprised of two older sisters, one younger sister, her mother, father and maternal grandmother. Chinese is the dominant language of the home.

Nina:

Nina was born with Down's Syndrome and bilateral cataracts. She is the youngest of two children. English is the language of the home. The cataracts were removed when Nina was five months of age and she was fitted with contact lenses. She has worn soft plastic lenses since she was eighteen months of age and these have made a great difference in helping Nina use her sight. Nina is quite small and has short arms and legs. She was included in the study eight months later than Amanda.

Procedure

Both children were seen for two hours weekly by a student-teacher. The weekly two hour sessions were videotaped at four months intervals. The data to be discussed were derived from the videotapes, which were scored in the categories mentioned by two raters. Six one-hour tapes were made of Nina and nine were made of Amanda. Interrater agreement was 89%.

RESULTS

Amanda

1. Frequency of reciprocal interactions with adult

Over the course of the intervention program, Amanda has more

than doubled the number of reciprocal interactions. She frequently initiated the interaction by taking the adult's hands and jumping up and down or swaying to signal that she wanted to play a particular rhyming game such as "London Bridge". Amanda also initiated reciprocal interactions by bringing objects to the attention of the adult. For example, she would bring a musical casette to the adult to be placed in the tape deck in order to begin "dancing" with the adult. Amanda often "stood her ground" by changing the rhyming game to the one of her choice. She rarely used vocal signals and relied primarily on posture and movement to both indicate her choice of game and initiate action with the adult. She also freely explored her teacher's carryall to find the object of her choice such as a book or another toy she knew her teacher had.

Figure 1 indicates the increase in the frequency of reciprocal interactions that took place during the sessions.

Insert Figure 1 about here

Amanda gradually increased the number of toys that were included in play. When she played with her teacher, Amanda's use of objects was more purposeful than when she played alone. For example, instead of building with blocks, when alone she would bang them together to hear the sounds she could produce.

Purposive actions with objects, such as building a tower with plastic rings, purposeful exploration of toys etc. took place while playing with another person. This was in marked contrast to the banging, shaking, or mouthing of toys that were characteristic of her play with objects when alone.

2. Responses to Adult Requests

Amanda's responses to adult requests reflected her growing comprehension of English . By the age of three years, she was consistently able to follow instructions such as "Turn around", "place your hands above your head", "move backwards', "forward", "side to side" or "stand on tiptoe". Amanda also knew body parts such as hips, shoulders, waist, ankle, knee etc.. She knew the names of most of her toys and other familiar household items. Figure 1 also shows the increase in her understanding of and willingness to comply with adult requests.

3. Spontaneous Verbalization

Despite her apparent comprehension of language (both Chinese and English) words were rarely spoken until Amanda approached her fourth birthday. Indeed there was very little vocalization of any type. Tape #6 records her first vocalization. She vocalized "wa wa" while playing in the water. Her earliest speech consistently co-occurs with actions. On Tape #8, eleven words and phrases were recorded and Tape #9 recorded 23 words and phrases, all in English.

Ninety percent of the words and phrases used by Amanda co-occur with actions. For example, she says "up" while picking something up, or "round" while dancing around etc.. Amanda has begun to imitate whole phrases of songs and sing with her teacher.

Amanda began to imitate when she began to say words. Then, all of a sudden, she began to repeat entire phrases of songs and rhymes. Her first word was a communicative imitation. Her teacher noted: "When I was leaving with my coat on, she sure didn't want me to go. She kept grabbing my coat making a whole bunch of sounds. Finally I told her I had to go and I said, 'Yes, Yes, Yes'. Amanda repeated "Yes" loud and clear as a bell." Amanda's expressive vocabulary in both English and Chinese is rapidly emerging. Comments are just beginning to appear. Performative vocalizations have not been observed during the sessions with Amanda.

Nina:

1. Frequency of reciprocal interactions.

The greatest number of reciprocal interactions with Nina occur as imitations of adult actions. Nina uses imitation as both a way of communicating and of acquiring skills in the use of toys. A sharp rise in the frequency of reciprocal interactions occurred when Nina was fitted with soft contact lenses. She was 18months old at the time. Nina relies primarily on vision to elicit and maintain adult attention. Her discovery of imitation as a strategy of learning enabled her to develop

an imitation game of her own. Nina now initiates an action and waits for the adult to imitate her. The "game" now includes vocalization as well as body posture and actions. For example she claps her hands and watches to see that her teacher also claps her hands. When the teacher does not imitate, Nina will take her teacher's hands and try to push them together to clap.

Figure 2 indicates the frequency of Nina's reciprocal interactions.

Insert Figure 2 about here

2. Responses to Adult Requests

As Nina approached 18 months, she demonstrated an increased comprehension of simple instructions. On Tape #5 she is able to consistently follow the requests of the "Cookie Monster" puppet to "show her tongue", "point to her head", "make a sound" etc.. Nina knows the names of most of her toys, familiar household objects, and body parts. Figure 2 also indicates the increase in the number of adult requests to which Nina complied.

3. Spontaneous Verbalization

Nina now has an expressive vocabulary of about ten single words. These occur mostly in co-occurrence with actions. She says "Moo" when asked what the cow says or "Baa" when asked what the sheep says. She utters "ooo-oo when something falls and articulates a drawn-out"aah" to indicate "I like this".

Nina employs a range of performative vocalizations and enjoys making onomatopaic sounds such as "whoosh","whirr", "grrr".

General Observations

Words occurred most frequently when both children were engaged in activity. Amanda made three comments during the sessions; no comments were recorded for Nina. Neither child has used words to make requests during the play sessions. There are a variety of performative vocalizations on Nina's tapes.

It was important for both children to determine what the adults expected before they were able to participate actively and spontaneously. As soon as they realized that their actions and responses were enjoyed and welcomed by the adult, both children began to participate actively. Vision appears to facilitate the use of imitation as a learning strategy. The frequency of Nina's interactions reflects the visual contact she was able to achieve. In contrast the totally blind child requires a form of modelling of actions and activities that physically engage the child.

DISCUSSION

The data are consistent with the hypothesis that reciprocal interaction with adults is the vehicle through which children learn to encode intention in gestural/vocal signals. Successful communication develops awareness of the communicative act and

facilitates the establishment of sign-referent relationships. True words are sign-referents and emerge as the child comprehends the relationship between words and their meanings. These data demonstrate the relationships that pertain between "first words" and how they seem to be embedded in the actions to which they refer.

Joint adult/child interactions instruct the child that 1) he or she can achieve an intended goal, 2) intent can be encoded in a gestural/vocal signal, and 3) there is a sequence involved in acts of communication. These sequences operate as one partner modifies his or her behavior to get the second partner to conform to a goal. The basis for learning language may indeed be built on the prior establishment of a system of rules for social interaction (Bruner, 1975).

Support for this interpretation of these findings comes from studies of non-handicapped children. Bates et al (1975) and Bullowa (1979) noted the role of performative vocalizations in association with joint adult/child reciprocal interactions. Vocalization at first tends to accompany hand gestures and then replaces them in the form of language. Rodgon (1978) and Dihoff and Chapman (1977) found that single word speech is closely tied to overt action. Carew, cited by Rodgon (1978) found that reciprocal adult/child interaction prior to 30 months of age showed high correlation with children's performance on the

Stanford Binet Intelligence scale at 30 months.

CONCLUSION

This study focused on the role of adult/child interaction in providing the visually impaired child with models of communication. Adult responses appear to enhance and direct the child's awareness of himself or herself as participant, initiator and partner in dialogic interchanges that incorporate a wide range of activities. Goal oriented behavior emerges when the child understands that people may function as means to a desired goal.

Human intelligence develops as an interpersonal process. Awareness and the ability to act with voluntary control in the physical world may indeed be a product of this process.

Thus adult/child play can be a vehicle through which the communicative and cognitive aspects of mental growth can be enhanced. It is suggested that planned intervention programs for blind and visually impaired young children will be most beneficial when strong components of adult/child play are included.

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Figure 1 Amanda: RECIPROCAL INTERACTIONS

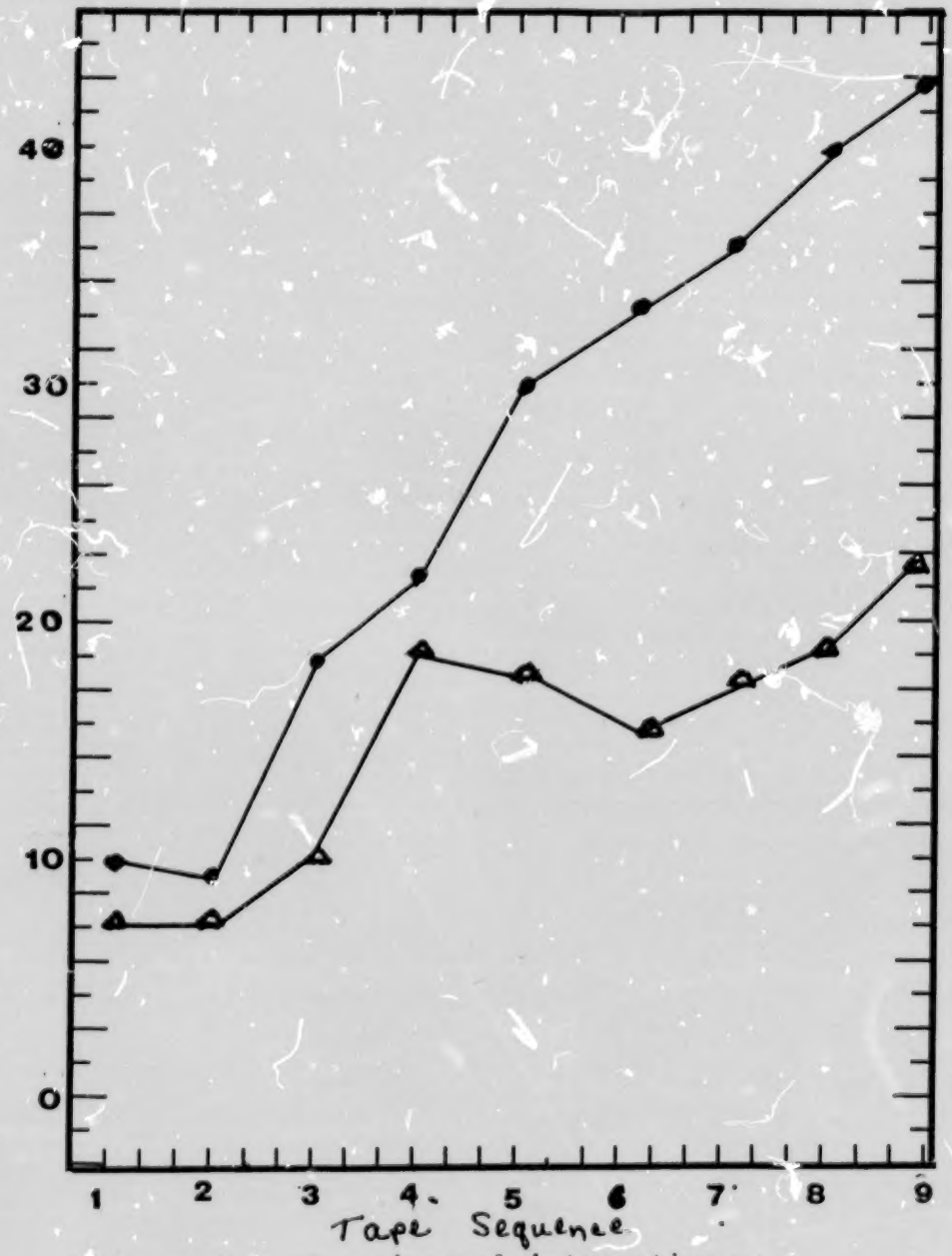
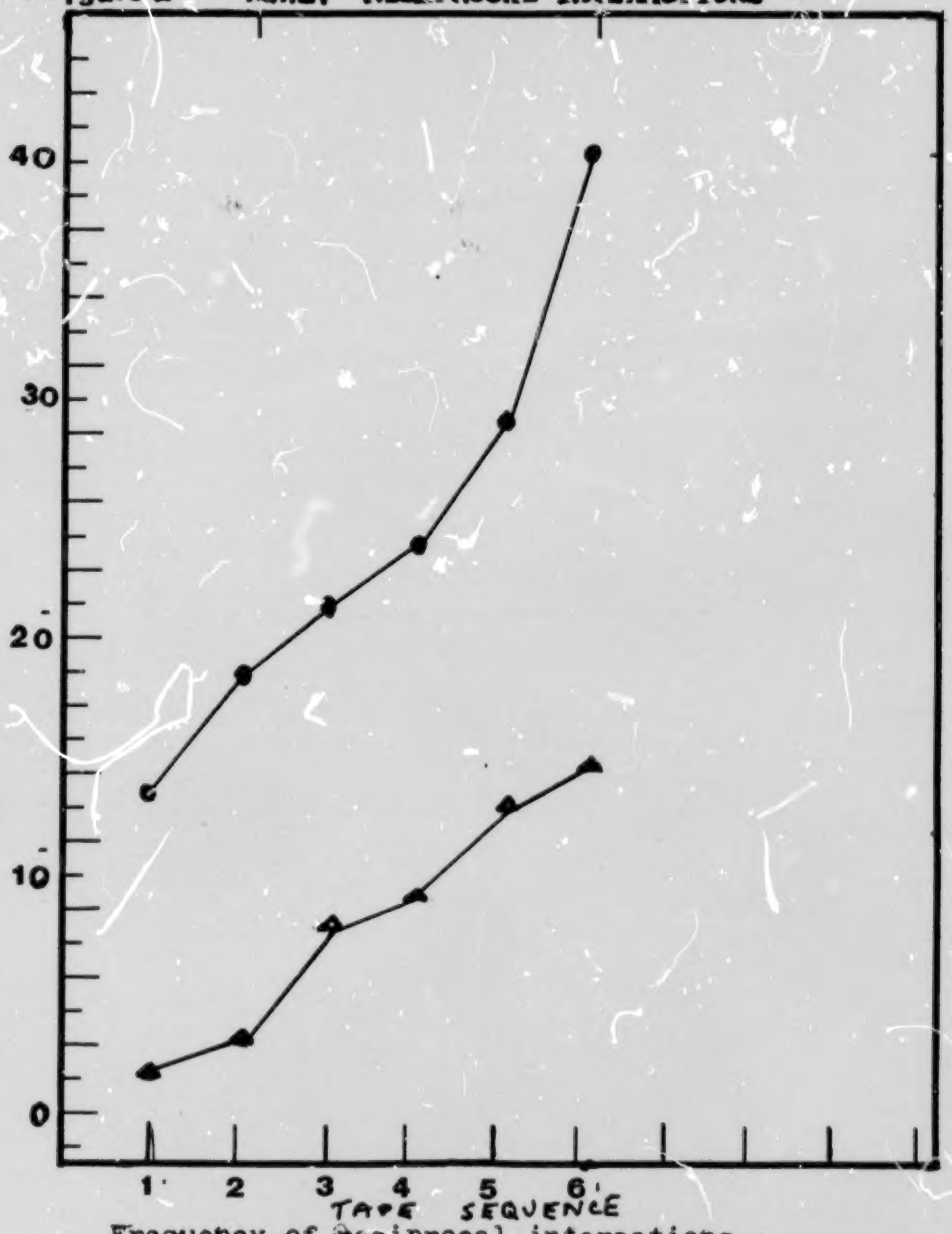


Figure 2 Mean RECIPROCAL INTERACTIONS



• Frequency of reciprocal interactions

△ Responses to Adult Requests

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